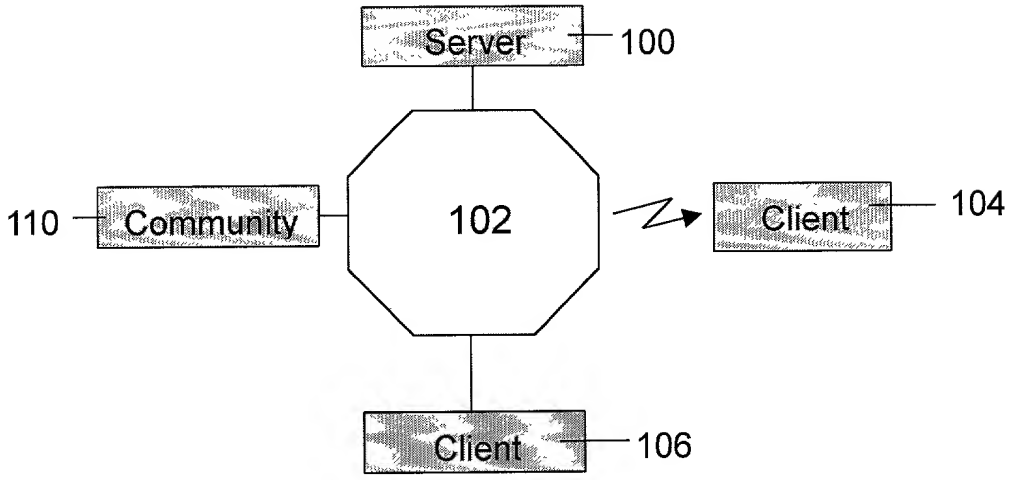

Server
100
110
Community
102
Client
104
Client
106

Fig 1

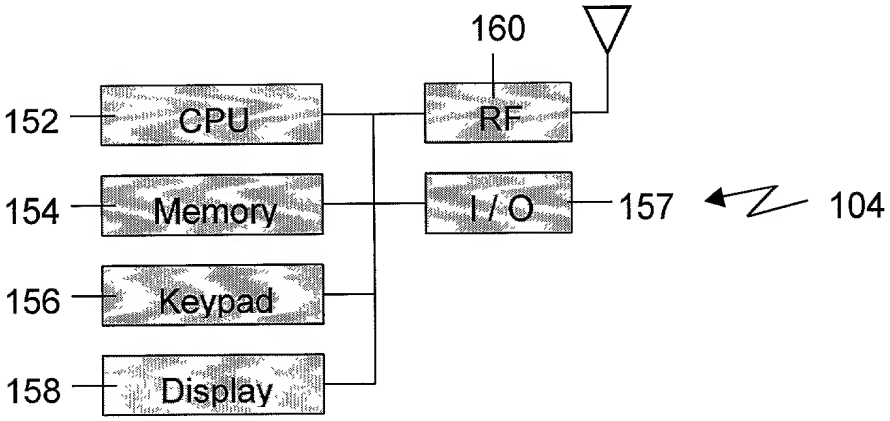

160
152
CPU
RF
154
Memory
I / O
157
104
156
Keypad
158
Display

Fig 2

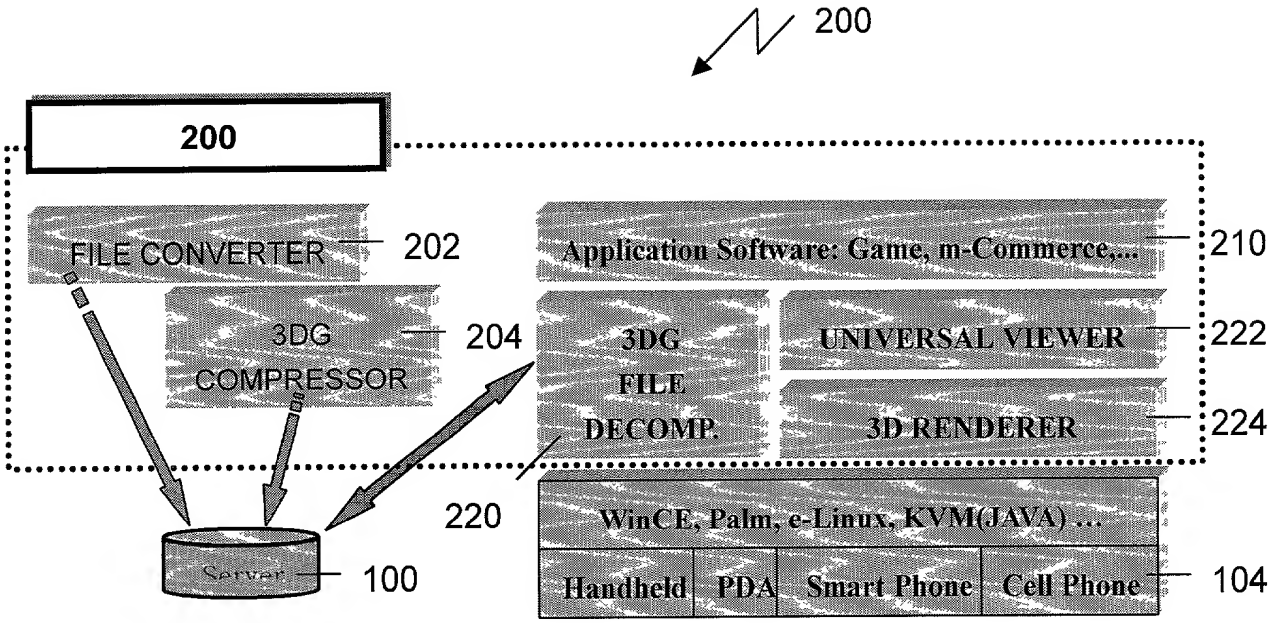

200
200
FILE CONVERTER
202
3DG
COMPRESSOR
204
Application Software: Game, m-Commerce,...
210
3DG
FILE
DECOMP.
UNIVERSAL VIEWER
222
3D RENDERER
224
220
WinCE, Palm, e-Linux, KVM(JAVA) ...
Handheld
PDA
Smart Phone
Cell Phone
104
Server
100
WIRELESS DEVICE

Fig 3

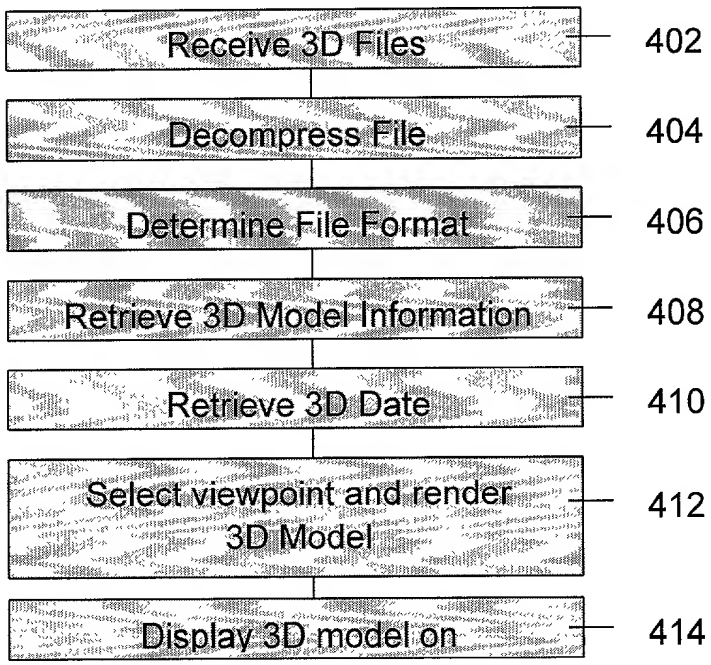
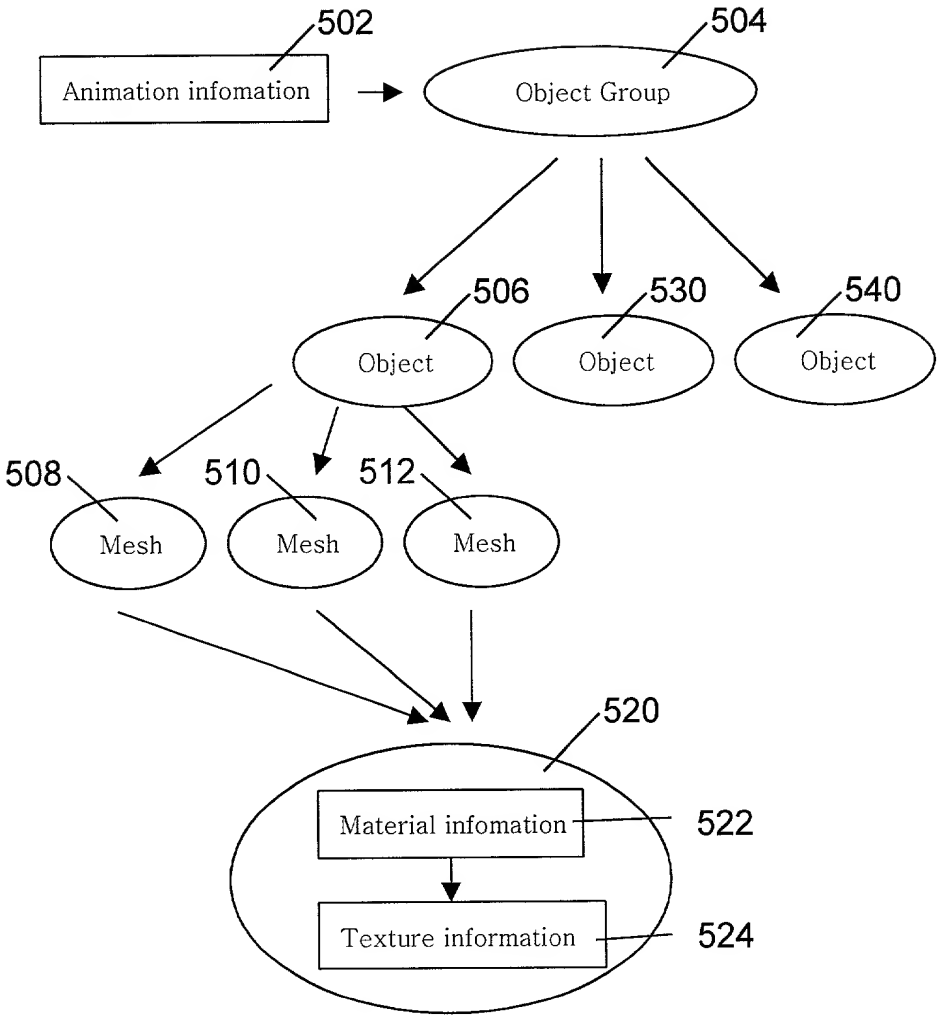

Receive 3D Files
402
Decompress File
404
Determine File Format
406
Retrieve 3D Model Information
408
Retrieve 3D Date
410
Select viewpoint and render 3D Model
412
Display 3D model on
414

Fig 4

3d modeling data structure



Object Group : animation information

Object : x,y,z position

Mesh :

Vertex Info : x,y,z position

Polygon Info : Information on vertex that make up polygon

Vector Info : Normal vector info needed to calculate lighting

Texture Info : texture coordinate info

Material Info : material index info

Lighting Info :

Fig 5

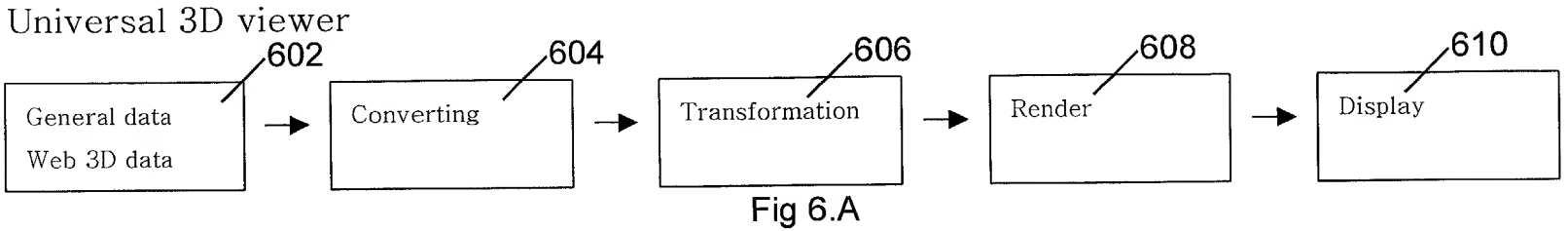

Universal 3D viewer
602
604
606
608
610
General data
Web 3D data
Converting
Transformation
Render
Display

Fig 6.A

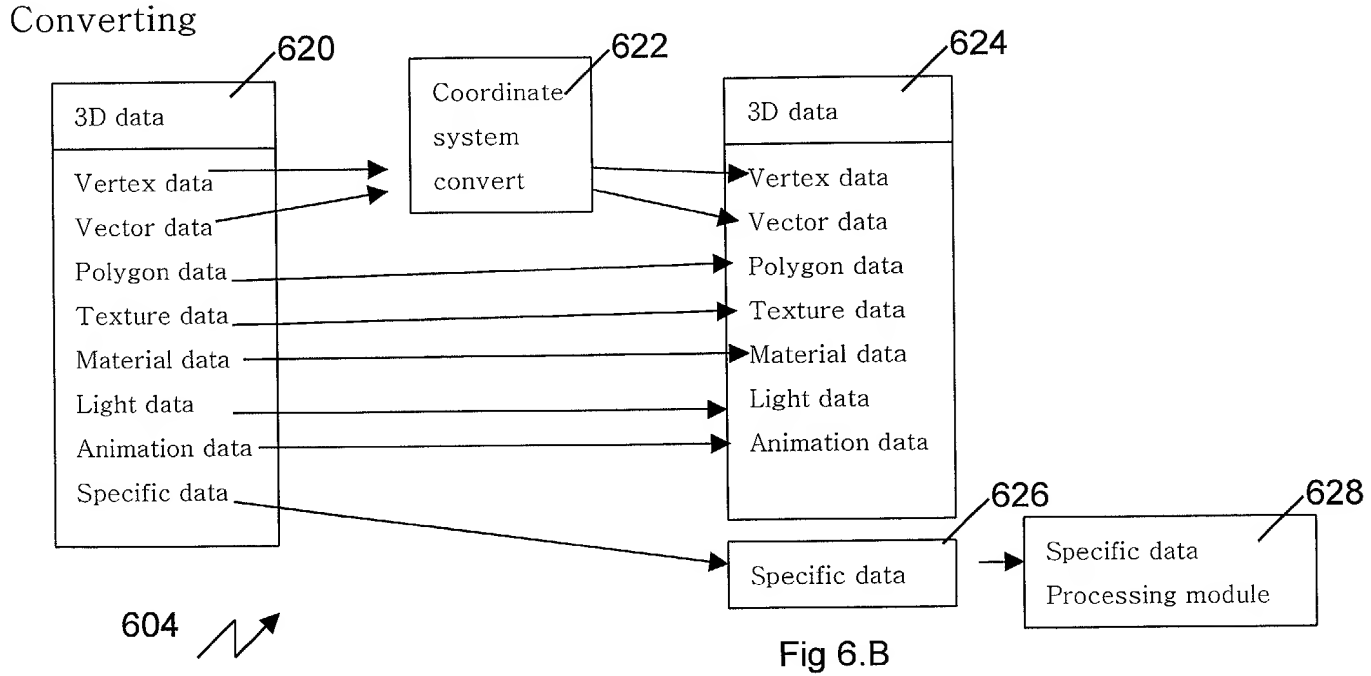

Converting
620
622
624
3D data
Vertex data
Vector data
Polygon data
Texture data
Material data
Light data
Animation data
Specific data
Coordinate system convert
3D data
Vertex data
Vector data
Polygon data
Texture data
Material data
Light data
Animation data
626
628
Specific data
Specific data Processing module
604

Fig 6.B

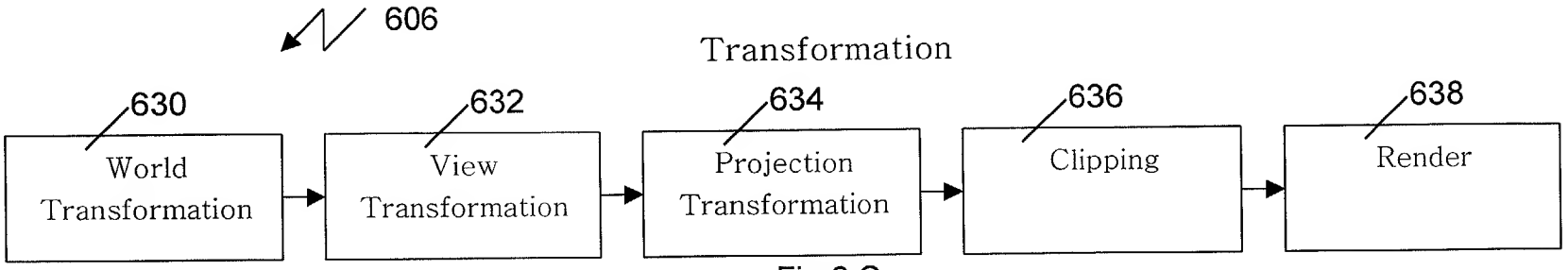


Fig 6.C

World Transformation : local to world transformation

View Transformation : world to camera transformation

Projection Transformation : 3D world to 2D world

Clipping : Clip polygons to viewing

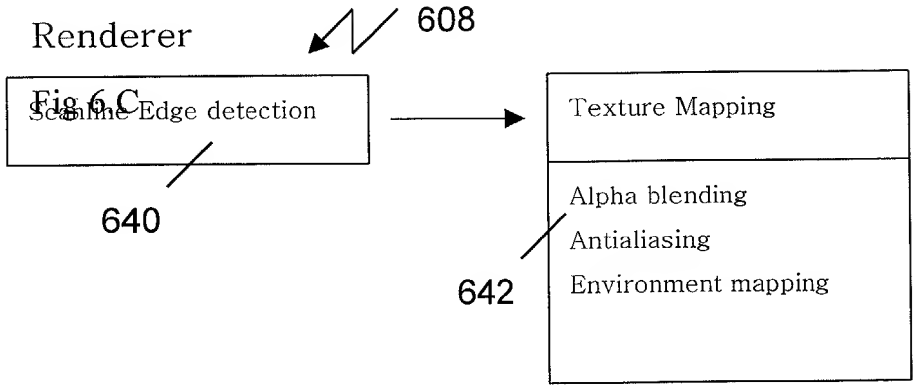


Fig 6.C

Fig 6.D

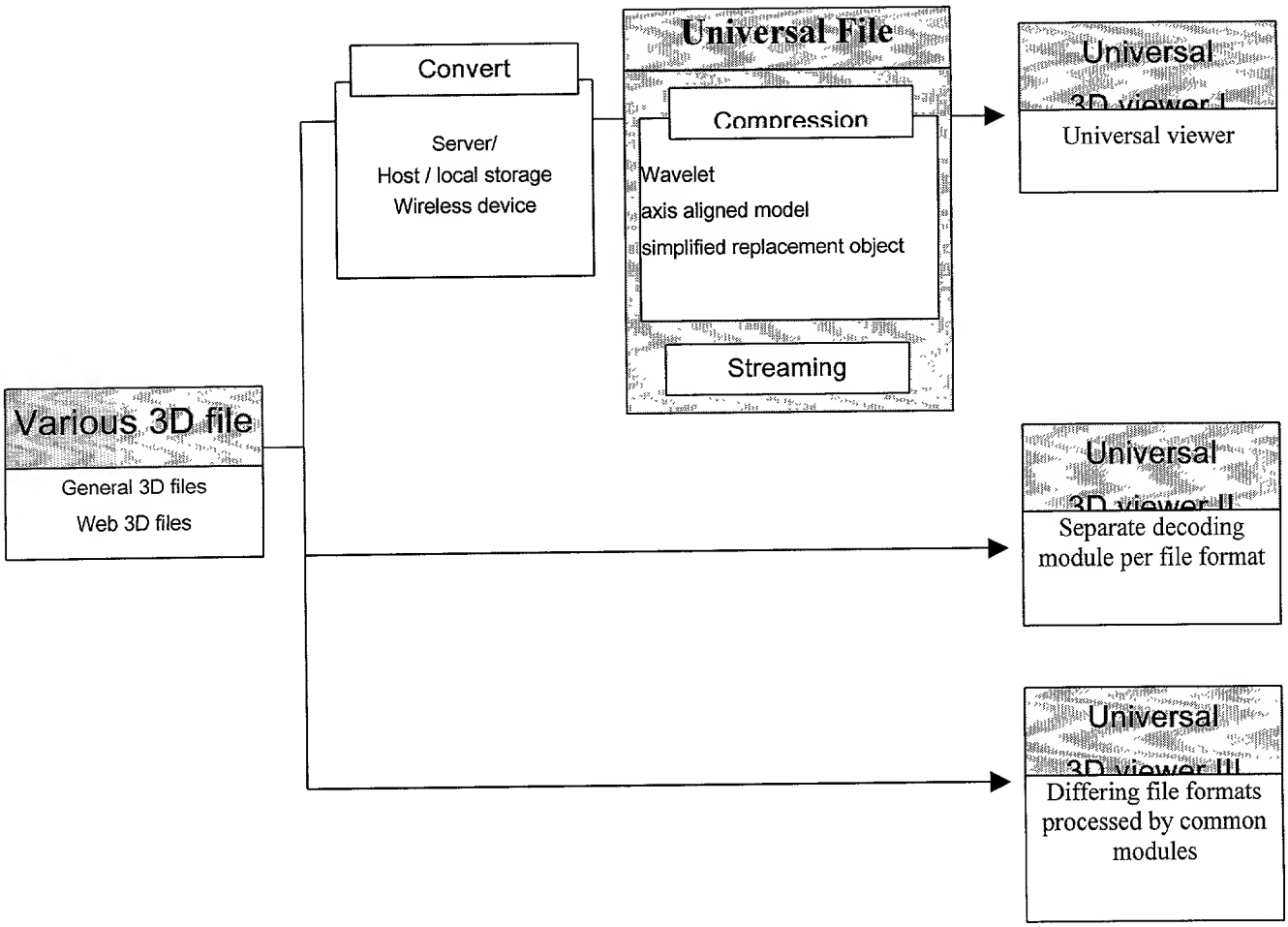

Various 3D file
General 3D files
Web 3D files
Convert
Server/
Host / local storage
Wireless device
Universal File
Compression
Wavelet
axis aligned model
simplified replacement object
Streaming
Universal
3D viewer I
Universal viewer
Universal
3D viewer II
Separate decoding
module per file format
Universal
3D viewer III
Differing file formats
processed by common
modules

FIG. 7A

FIG. 7B

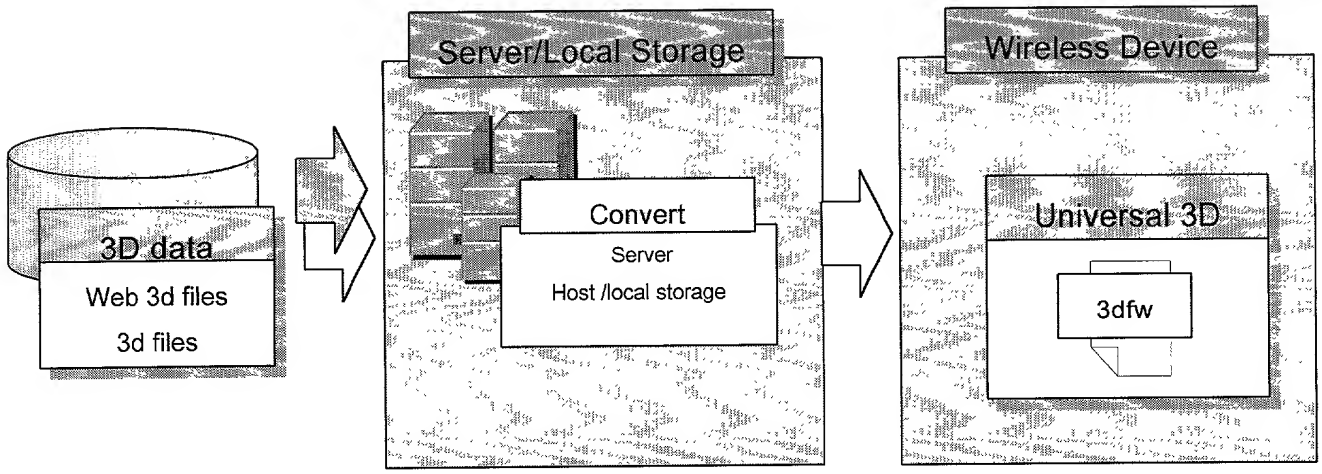


FIG. 7C

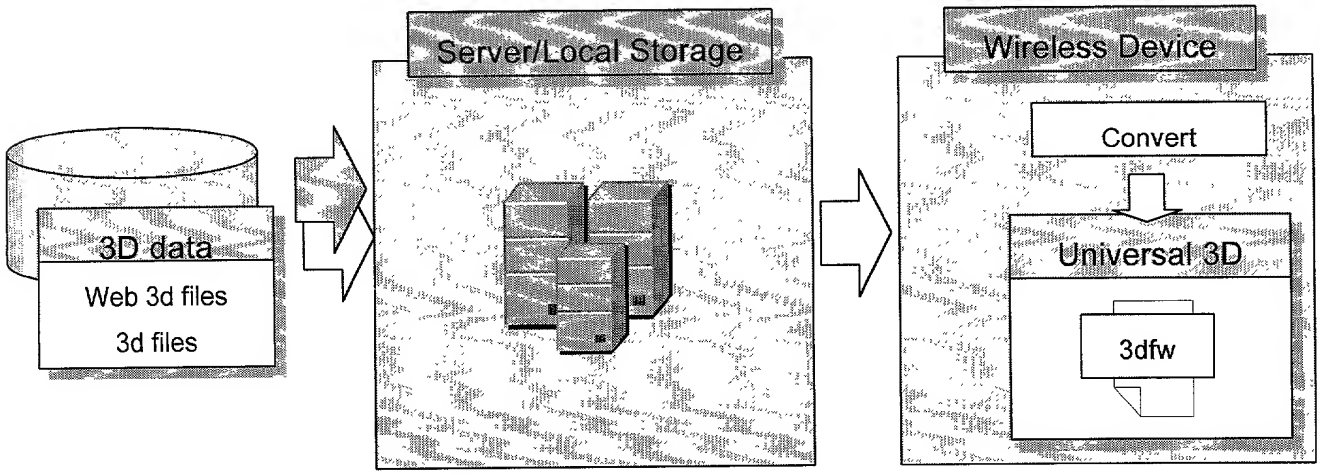


FIG. 7D

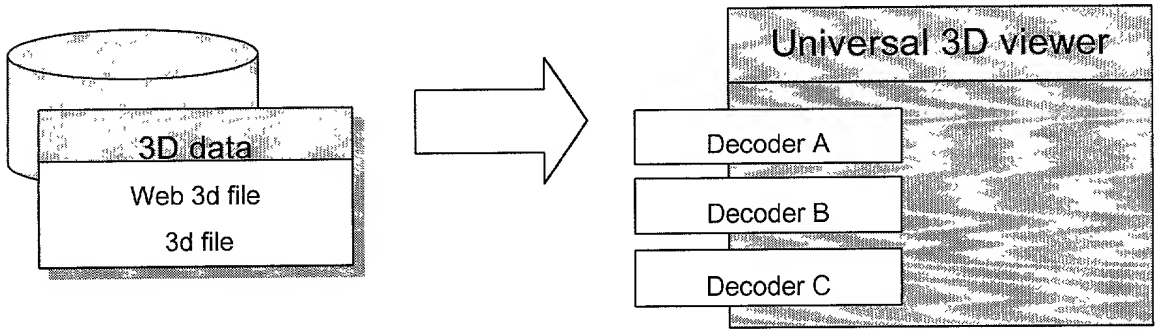
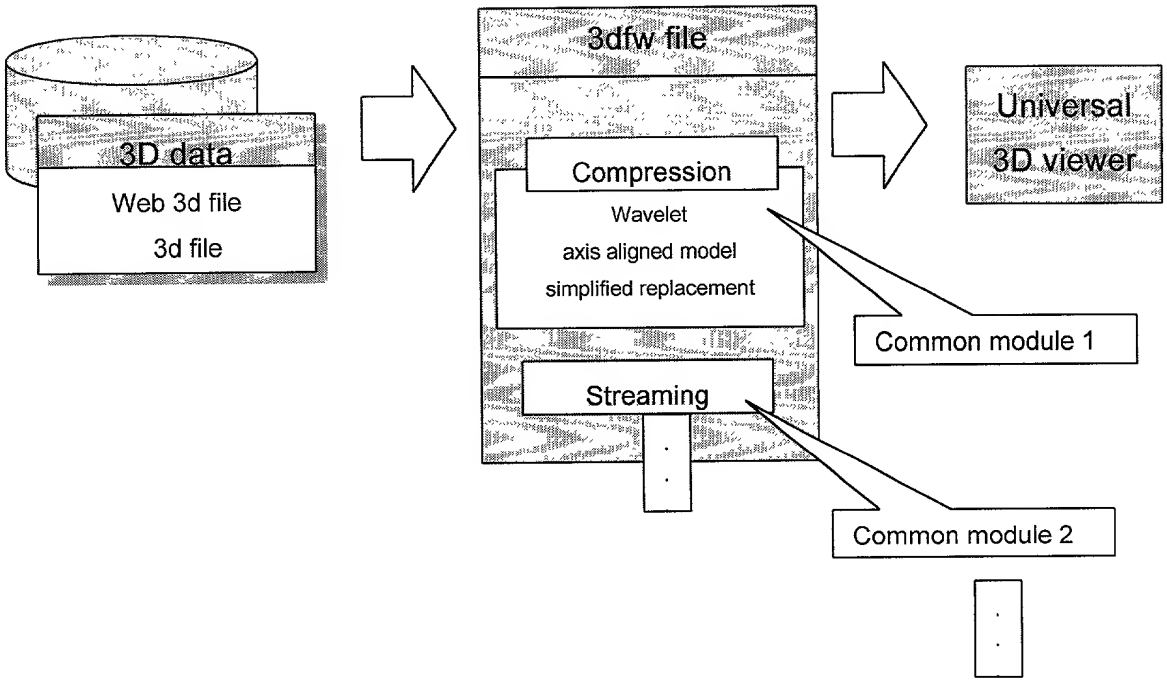
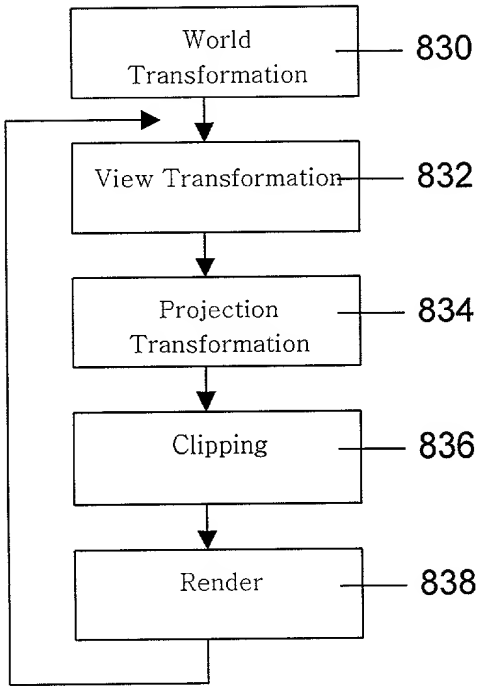


FIG. 7E


3D data
Web 3d file
3d file
3dfw file
Compression
Wavelet
axis aligned model
simplified replacement
Streaming
Universal
3D viewer
Common module 1
Common module 2

800



< rendering of stationary objects >

Fig 8